

IN THE SPECIFICATION

On page 1, following "BACKGROUND OF THE INVENTION," please insert the following.

CROSS REFERENCE

AM This application is a continuation of US Patent No. 6,249,539, filed on June 15, 1998, and is incorporated herein by reference.

IN THE DRAWINGS

Please replace Figure 1 with corrected Figure 1.

IN THE CLAIMS

Please cancel claims 1-34 and add the following claims 35-57.

35. Apparatus for narrowing the range of frequency uncertainty of a detected pilot signal comprising:

an accumulator configured to coherently accumulate samples of detected pilot signals over a plurality of chips for each of a plurality of frequency hypothesis;

an energy detector coupled to the accumulator and configured to measure energy of the accumulated pilot signal samples;

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Const an energy accumulator coupled to the energy detector and configured to accumulate a plurality of energy measurements from the energy detector to produce an energy accumulation value (EAV);

a max-detector coupled to the energy accumulator and configured to determine which of a plurality of frequency hypotheses results in a highest EAV.

36. The apparatus of claim 35, further comprising:

a despreader configured to despread the detected pilot signals into at least two sample sets of pilot signals and providing the sample sets to the accumulator,

wherein the accumulator coherently accumulates the at least two sample sets, wherein the energy detector measures the energy of the accumulated pilot signal samples of the two sample sets, and wherein the energy accumulator accumulates a plurality of energy measurements to produce an EAV for each of the two sample sets.

37. The apparatus of claim 36, wherein the despreader comprises:
a decimator configured to decimate the detected pilot signal and produce a first sample set; and
a delay element coupled to the decimator and configured to delay the first sample set of pilot signals and produce a second sample set of pilot signals.

38. The apparatus of claim 35, further comprising:
a despreader configured to despread the detected pilot signals by combining the detected pilot signal with proper PN code sequences before coherently accumulating samples of pilot signals;
a code Doppler correction accumulator configured to periodically adjust the timing phase between the proper PN code sequences and the detected pilot signals.

39. The apparatus of claim 38, further comprising:
a timing generator coupled to the despreader and the code Doppler correction accumulator, the timing generator configured to send the proper PN code sequences earlier or later than nominal based upon a signal from the code Doppler correction accumulator.

40. The apparatus of claim 35, further comprising:
a complex rotator configured to shift frequency spectrum of the detected pilot signal by a current frequency hypothesis; and
a despreader configured to despread the detected pilot signals with shifted frequency spectrum before coherently accumulating samples of pilot signals.

41. The apparatus of claim 40, further comprising:
a synthesizer configured to synthesize the current frequency hypothesis using a current frequency hypothesis value; and
a frequency accumulator configured to supply the synthesizer with the current frequency hypothesis value.
42. Apparatus for a spread spectrum communication system, comprising:
searcher receiver configured to detect a pilot signal within a frequency bin bounded by an upper frequency;
a despreader configured to despread the detected pilot signal;
an accumulator configured to coherently accumulate samples of despread pilot signals over a plurality of chips for each of a plurality of frequency hypothesis;
an energy detector coupled to the accumulator and configured to measure energy of the accumulated pilot signal samples;
an energy accumulator coupled to the energy detector and configured to accumulate a plurality of energy measurements from the energy detector to produce an energy accumulation value (EAV);
a max-detector coupled to the energy accumulator and configured to determine which of the plurality of frequency hypotheses results in a highest EAV.
43. The apparatus of claim 42, wherein the despreader comprises:
a decimator configured to decimate the detected pilot signal and produce one sample set of pilot signals; and
a delay element coupled to the decimator and configured to delay the first sample set and produce a second sample set of pilot signals;
wherein the accumulator coherently accumulates the at least two sample sets, wherein the energy detector measures the energy of the accumulated pilot signal samples of the two sample sets, and wherein the energy accumulator accumulates a plurality of energy measurements to produce an EAV for each of the two sample sets.

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44. The apparatus of claim 42, wherein the despreader despreads the detected pilot signals by combining the detected pilot signal with proper PN code sequences, and wherein the apparatus further comprises:

a code Doppler correction accumulator configured to periodically adjust the timing phase between the proper PN code sequences and the detected pilot signals.

45. The apparatus of claim 44, further comprising:

a timing generator coupled to the despreader and the code Doppler correction accumulator, the timing generator configured to send the proper PN code sequences earlier or later than nominal based upon a signal from the code Doppler correction accumulator.

46. The apparatus of claim 44, wherein the searcher receiver detects the pilot signal within a frequency bin bounded by a lower frequency and an upper frequency, and wherein the code Doppler correction accumulator adjust the timing phase based on a code Doppler error estimate, the apparatus further comprising:

means for estimating the code Doppler error based on a frequency within the frequency bin.

47. The apparatus of claim 46, wherein the means for estimating the code Doppler error comprises:

means for determining Doppler ratio based on the upper frequency and transmitter chip rate; and

means for determining the code Doppler error based on the Doppler ratio and receiver bit rate.

48. The apparatus of claim 42, further comprising:

a complex rotator configured to shift frequency spectrum of the detected pilot signal by a current frequency hypothesis before despreads the detected pilot signals.

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49. The apparatus of claim 48, further comprising:
a synthesizer configured to synthesize the current frequency hypothesis using a current frequency hypothesis value; and
a frequency accumulator configured to supply the synthesizer with the current frequency hypothesis value.
50. The apparatus of claim 49, wherein the current frequency hypothesis value is the frequency hypothesis corresponding to the highest EAV.
51. The apparatus of claim 42, further comprising:
a storage configured to store a maximal EAV; and
wherein the max-detector compares the EAV from the energy accumulator to the maximal EAV to determine which of the plurality of frequency hypotheses results in the highest EAV.
52. The apparatus of claim 42, further comprising:
a digital data receiver configured to demodulate signals based on a frequency hypothesis corresponding to the highest EAV.
53. The apparatus of claim 42, further comprising:
an analog-to-digital converter configured to digitize the detected pilot signal and producing samples of detected pilot signals at eight times the chip rate of the pilot signal.
54. Apparatus for estimating chip rate of a detected pilot signal within a frequency bin bounded by an upper frequency, the method comprising:
means for estimating code Doppler error based on the upper frequency; and
means for estimating the chip rate of the detected pilot signal based on transmitter chip rate and the estimated code Doppler error.

55. The apparatus of claim 54, wherein the means for estimating the code Doppler error comprises:

- means for assuming frequency of the detected pilot signal is the upper frequency;
- means for determining Doppler ratio based on the upper frequency and the transmitter chip rate; and
- means for determining the code Doppler error based on the Doppler ratio and receiver bit rate.

56. A method for estimating chip rate of a detected pilot signal within a frequency bin bounded by an upper frequency, the method comprising:

- estimating code Doppler error based on the upper frequency; and
- estimating the chip rate of the detected pilot signal based on transmitter chip rate and the estimated code Doppler error.

57. The method of claim 56, wherein estimating the code Doppler error comprises:

- assuming frequency of the detected pilot signal is the upper frequency; and
- determining Doppler ratio based on the upper frequency and the transmitter chip rate;

rate;

- determining the code Doppler error based on the Doppler ratio and receiver bit rate.
